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We are able to reproduce photographs, taken by Schutz of Washington, of the members of the academy on the steps of the United States National Museum.

THE ORIGIN OF CIVILIZATION

Professor Breasted in his first lecture before the National Academy followed the long development which lies behind the pyramids of Egypt and leads up to them. They mark the culmination of a civilization advancing so rapidly that the thirtieth century B.C. saw a greater development of man's control over the forces of nature than any other century in human history, except the nineteenth century of our own era.

In his second lecture Professor Breasted said that the cemetery of Gizeh, especially the Great Pyramid, is the earliest and most impressive surviving witness to the final emergence of highly organized and efficient government, of which it is the product. Yet the great grandfathers of the men who built the Great Pyramid laid the first examples of stone masonry. We find it difficult to understand the rapidity of an advance in government, organization, mechanics, engineering and craftsmanship, which could lay out this vast building, covering thirteen acres, with an accuracy involving an error in the length of the sides of less than twelve-thousandth of the length of the side (755 feet), and error of 6/100 of a foot. Neither can we comprehend an efficiency in administration, which could quarry out, transport and lay in position, 2,300,000 blocks of limestone each weighing about two and a half tons. This pyramid, continued Professor Breasted, is the greatest building and engineering feat ever achieved by ancient man, and it was constructed at the outset of his historic career.

Professor Breasted then pointed out that later an amazingly refined pre-Greek civilization arose in the Ægean Islands, especially in Crete, as revealed by the excavations of Sir Arthur Evans and others. After 1500 B.C. the barbarian Greek shepherds who had been migrating southward through the Balkans for centuries, took possession of the country and the islands which we have so long been accustomed to know as theirs. They destroyed the wonderful culture of the Ægeans, which had been the first civilization on the soil of Europe, and thus in the centuries after 1200 B.C. civilization disappeared in Europe. Europe had thus to receive civilization a *second time* after 1000 B.C., and again it came from the Orient, where alone it was preserved after the Greeks had destroyed it in Europe. It came at first in the ships of the Phœnicians, and we recall the well-known fact that among many other things the Phœnicians carried an oriental alphabet to Europe From the Phœnicians the Greeks learned arts and crafts, decorative art, and especially ship-building. This last achievement enabled the Greeks to visit the great cities of the East themselves. In 600 B.C. there was not a Greek city anywhere which could not be crossed on foot from one edge to the other in ten minutes or much less. They were built of sun-dried brick, and the great monumental cities of the Near Orient made a tremendous impression on the Greek visitors.

Meantime Babylonian civilization by way of Asia Minor had brought in many important contributions to European life, like ordinary business customs, and conveniences like business credit, still a fundamental element of civilization. Such influences are especially noticeable in architecture. The Greeks adopted the colonnade from Egypt, and when they wished to erect a lighthouse tower at Alexandria, they put up a modified form of the temple towers they had seen in Babylonia, which thus became the ancestors of the church spires of Europe. When the Greek architects desired the model of an administrative building they adopted the clerestory of the Egyptian temple, and this important architectural element thus entered Europe to become part, and indeed the most characteristic part of the Christian cathedral.

THE STRUCTURE OF THE ATOM

At the meeting of the National Academy of Sciences, an hour was devoted to an address by Dr. Irving Langmuir, of the General Electric Company, which attracted much attention, it being said that there were present to listen to it as many as four hundred chemists and physicists from the Bureau of Standards. Dr. Langmuir's hypothesis on the arrangement of the electrons in atoms correlates a number of different proposals concerning the possible structure of atoms, and substitutes one general theory which indicates that the electrons do not revolve about the nucleus of the units of matter, but are stationary.

The new theory is based on the theory of Rutherford and the more recent theory of G. N. Lewis. It extends the original conceptions which assume that the atom is constructed on a nucleus of about a millionth of the diameter of the atom, which itself is about one hundred-millionth of an inch in diameter. The atom is made up of negative electrons arranged about the positively charged nucleus.

The atoms of different elements have different charges on their nuclei and they are thus capable of holding different numbers of electrons. This permits the arrangement of atoms of elements in a definite order with a difference of one electron each. For example, the first element in the scale is hydrogen, with an atomic number of one. Helium is next with a difference of one and is designated as 2. Thence up the scale through all the elements to uranium with 92 electrons.

Dr. Langmuir, starting with the known properties of the elements, has tried to determine what the arrangements of the electrons about the different nuclei must be to account for the properties of the elements themselves. He assumes that these electrons are not rotating about the nucleus, but that they are stationary and arranged in three definite dimensions in a lattice-work pattern of geometrical form.

All the atoms of the inert gases, such as helium, argon and radium emanations, are stable, and exist in a form having a symmetry like that of a tetragonal prism. With these and other simple assumptions, Dr. Langmuir finds the general features of atoms, their chemical and physical properties, well explained. Thus he discovers why iron and nickel are magnetic, and explains the properties of rare earth elements which chemists have never satisfactorily placed in the periodic table.

His theory leads to a new conception of chemical combination and modifies some of the simplest chemical facts and formulas. The structure of nitrogen, for example, with its inert properties, is explained. A molecule of nitrogen has a structure similar to that of an atom of argon. In organic or carbon compounds this theory applies particularly well. It explains the ordinary theory of valence and indicates when this must be modified.

Chemists have had trouble with organic compounds containing nitrogen. The structures of many compounds were puzzling, and never agreed upon. The new theory, how-